

AMENDMENTS TO THE CLAIMS

Claims 1-3 (cancelled)

Claim 4 (currently amended). A shoulder orthosis device for effecting at least one of internal rotation and external rotation of ~~rotational movement of a lower arm portion of a patient's arm about a central longitudinal axis of a humerus bone of an upper arm portion of the~~ a patient's arm, comprising:

a lower arm section configured for receiving ~~the~~ a lower arm portion of a patient's arm, the lower arm section configured, dimensioned, and arranged for maintaining the lower arm portion substantially orthogonal to ~~the~~ an upper arm portion of the patient's arm, the lower arm section including a lower cuff configured to receive and grip the lower arm portion and a hand cuff spaced apart from the lower cuff, the hand cuff being configured to receive and grip a hand portion of the lower arm portion, ~~the lower arm section further including an outer and inner channel members, wherein the lower cuff is attached to the outer channel member~~ a first segment and the hand cuff is attached to the inner channel member a second segment, wherein the first segment and the second segment are slidably coupled together by at least one channel; and

a drive member operably connected to the lower arm section proximate ~~the~~ an elbow of the patient's arm and including a gear connected to the lower arm section having an axis extending through ~~substantially coincidental with the central longitudinal axis of the humerus~~ upper arm portion of the patient's arm and manually operable by the patient to rotate the lower arm portion ~~about the central longitudinal axis of~~ to cause at least one of internal rotation and external rotation of the humerus bone the upper arm portion of the patient's arm such that the lower arm portion is maintained substantially orthogonal to the upper arm portion,

whereby, during at least a portion of the rotation of said gear, the ~~humerus~~ upper arm portion of the patient's arm is rotated, ~~through its connection with the lower arm~~

~~portion of a patient's arm, about its longitudinal axis, and body tissue in the a shoulder joint is thereby stretched.~~

Claim 5-9 (cancelled)

Claim 10 (currently amended). A shoulder orthosis device for ~~effecting rotational movement of a lower arm portion of a patient's arm about a central longitudinal axis of internally and externally rotating a humerus bone of~~ an upper arm portion of the a patient's arm, comprising:

a lower arm section configured for receiving the a lower arm portion of a patient's arm, the lower arm section configured, dimensioned, and arranged for maintaining the lower arm portion substantially orthogonal to the an upper arm portion of a patient's arm; ~~and~~

an upper arm section rotatably connected to the lower arm section and configured to receive the upper arm portion of the patient's arm, wherein the lower arm section is substantially orthogonal to the upper arm section, and wherein the upper arm section is telescopically adjustable in length; and

a drive member operably connected to the lower arm section proximate the elbow and including a gear connected to the lower arm section having an axis substantially parallel to and spaced apart from the upper arm section, the axis passing through the upper arm portion of the patient's arm, the drive member being coincidental with the central longitudinal axis of the humerus and manually operable by the patient to rotate the lower arm portion ~~about the central longitudinal axis to cause at least one of internal and external rotation of the humerus bone~~ upper arm portion of the patient's arm such that the lower arm portion is maintained substantially orthogonal to the upper arm portion;

~~an upper arm section rotatably connected to the lower arm section, such that the lower arm section is substantially orthogonal to the upper arm section, the upper arm section including a lower channel member slidably affixed to an upper channel member;~~

whereby, during at least a portion of the rotation of said gear, the humerus upper arm portion of the patient's arm is rotated, ~~through its connection with the lower arm portion of a patient's arm, about its longitudinal axis,~~ and body tissue in the a shoulder joint is thereby stretched.

Claim 11 (currently amended). The shoulder orthosis device according to claim 10, wherein the upper arm section further comprises an upper cuff ~~attached to the upper channel member,~~ the upper cuff being configured to receive and grip the upper arm portion.

Claim 12-22 (cancelled)

Claim 23 (currently amended). A shoulder orthosis device for effecting internal and external rotational movement ~~of a lower arm portion of a patient's arm about a central longitudinal axis of a humerus bone~~ of an upper arm portion of the a patient's arm, comprising:

a base section shaped to engage ~~conform to the~~ a patient's trunk ~~of a patient~~;

an upper arm section pivotally attached to the base section, the upper arm section defining an upper arm section longitudinal axis, and the upper arm section being configured to engage an upper arm portion of the patient;

a lower arm section rotatably connected to the upper arm section, such that a lower arm section longitudinal axis is substantially orthogonal to the upper arm section longitudinal axis, the lower arm section including ~~an~~ lower cuff and a hand cuff configured to receive, grip, ~~and maintain the~~ a lower arm portion of the patient substantially orthogonal to the upper arm portion;

a manually operated drive member connected to the lower arm section proximate the an elbow of the patient, the manually operated drive member ~~and~~ including a gear connected to the lower arm section having an gear axis that is substantially parallel to and spaced apart from the upper arm section longitudinal axis ~~coincidental with the central~~

~~longitudinal axis of the humerus, wherein~~ the drive member is operable by the patient to move the lower arm section relative to the upper arm section such that the lower arm portion is rotated about the gear ~~central longitudinal axis of the humerus bone~~ while the lower arm portion remains substantially orthogonal to the upper arm portion, whereby, during at least a portion of the rotation of said gear, the ~~humerus~~ upper arm portion is rotated, ~~through its connection with the lower arm portion of a patient's arm, about its longitudinal axis;~~ and body tissue in the a shoulder joint is thereby tensioned;

means associated with the manually operated drive member operative to maintain a position of said gear when operation of said manually operated drive member is interrupted;

means associated with the manually operated drive member operative to reverse the direction of rotation of said gear; and

means connected to said upper arm section operative to align the upper arm portion with a glenoid cavity of a the shoulder joint.

Claim 24 (currently amended). The shoulder orthosis device of claim 23, wherein the gear is disposed ~~below~~ adjacent to the elbow.

Claim 25 (new). An orthosis for stretching tissue associated with a shoulder joint of a patient, the orthosis comprising:

a base section for releasably coupling to a trunk of a patient, the base section being shaped for engagement with the trunk and including at least one strap arranged to extend at least partially around the trunk;

an upper arm section for releasably engaging an upper arm of the patient;

a pivot interposing the base section and the upper arm section;

a secondary drive assembly mounted to the base section and the upper arm section, the secondary drive assembly being manually operable to articulate the upper arm section relative to the base section about the pivot;

a lower arm section for releasably engaging a lower arm of the patient; and

a main drive assembly connecting the upper arm section and the lower arm section, the main drive assembly being manually operable to rotate the lower arm section relative to the upper arm section about an axis lying substantially parallel to and spaced apart from the upper arm section.

Claim 26 (new). The orthosis of claim 25, wherein the main drive assembly includes an opening configured to receive an elbow of the patient therein, the opening lying on the axis about which the main drive assembly is manually operable to rotate the lower arm section relative to the upper arm section.

Claim 27 (new). The orthosis of claim 26, wherein the main drive assembly includes a main gear comprising an arcuate array of gear teeth; and wherein the main gear is fixedly connected to lower arm section.

Claim 28 (new). The orthosis of claim 27, wherein the main gear is fixedly connected to the lower arm section adjacent the elbow.

Claim 29 (new). The orthosis of claim 27, wherein the main gear forms at least a portion of the opening.

Claim 30 (new). The orthosis of claim 27, wherein the main drive assembly includes
a ratchet connected to a worm gear by an input shaft,
a second pinion in meshing engagement with the worm gear, and
a first pinion in meshing engagement with the main gear, the first pinion being coupled to the second pinion by a drive shaft;

wherein the ratchet, the worm gear, the input shaft, the second pinion, the first pinion, and the drive shaft are rotatable in fixed positions relative to the upper arm section; and

wherein operation of the ratchet causes rotation of the main gear relative to the upper arm section.

Claim 31 (new). The orthosis of claim 25, wherein operation of the main drive assembly in first and second directions provides internal and external rotation, respectively, of a humerus associated with the upper arm of the patient.

Claim 32 (new). The orthosis of claim 25, wherein the lower arm section is substantially orthogonal to the upper arm portion.

Claim 33 (new). The orthosis of claim 25, wherein the lower arm section includes an inner channel and an outer channel; wherein a lower cuff is attached to the outer channel; and wherein a hand cuff is attached to the inner channel.

Claim 34 (new). The orthosis of claim 25, wherein the upper arm section includes a lower channel slidably affixed to an upper channel.

Claim 35 (new). The orthosis of claim 25, wherein the base section includes a flexible body section and a pad interposing the flexible body section and the trunk.

Claim 36 (new). The orthosis of claim 25, wherein the secondary drive assembly includes

- a tower which substantially bisects an angle between the base section and the upper arm section,

- a screw including external threads, the screw being rotatably mounted in the tower,

- an actuator block including internal threads, the internal threads operatively engaging the external threads,

- a first link extending between the actuator block and the base section, and

a second link extending between the actuator block and the upper arm section.

Claim 37 (new). The orthosis of claim 36, wherein the first link and the second link are substantially equal in length.

Claim 38 (new). The orthosis of claim 25, wherein the secondary drive assembly is operable to substantially align a humerus associated with the upper arm of the patient with a glenoid cavity associated with the humerus.

Claim 39 (new). The orthosis of claim 25, wherein the axis is proximate a humerus associated with an upper arm of the patient when the upper arm section engages the upper arm of the patient.

Claim 40 (new). The shoulder orthosis device of claim 4, wherein the upper arm portion of the patient's arm extends between an elbow of the patient and a shoulder of the patient.

Claim 41 (new). The shoulder orthosis device of claim 40, wherein the upper arm portion of the patient's arm includes a humerus; and wherein the drive member is manually operable by the patient to cause at least one of internal rotation and external rotation of the humerus.

Claim 42 (new). The shoulder orthosis device of claim 10, wherein the upper arm portion of the patient's arm extends between an elbow of the patient and a shoulder of the patient.

Claim 43 (new). The shoulder orthosis device of claim 42, wherein the drive member is manually operable by the patient to cause at least one of internal and external rotation of a humerus associated with the upper arm portion of the patient's arm.

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Claim 44 (new). The shoulder orthosis device of claim 4, wherein the at least one channel includes a first channel associated with the first segment; and wherein the second segment is slidably coupled to the first channel.

Claim 45 (new). The shoulder orthosis device of claim 44, wherein the at least one channel further includes a second channel associated with the second segment; and wherein the second channel is slidably coupled to the first channel.